



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D212-664-101
Job Sheet 168758-B



Part No: D212-664-101

Job Qty: 1 ea

Part Name: Fwd Crosstube - High



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 11/22/17

Job Tracking No:

Due Date: 12/14/17

Created By: Linda Lacelle

Type: SOLD

Description:

Customer: Ascent Helicopters Ltd (CASCE01)

1550 Springhill Road Parksville, BC, V9P 2Y2 Canada ph:(250) 752-2981 fx:(250) 752-2983.

Note: DWG REV E IPP Rev:E 04.02.16 Reformat KJ/DS IPP Rev:F 06-03-29 Remove Comments on Pick List JLM IPP
Rev:G 07-04-30 As per Rev C JLM IPP Rev:H 11.04.26 inspection strip ecn 11-549 EC verf by:DD IPP REV:I
14.05.27 AS PER ECN 14-570 DD VERF:JLM

Ship Via:

Bill of Materials

DART
AEROSPACE
S030994



Fwd Crosstube - High

Dart Aerospace Ltd.

1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

PART NO: D212-664-101

Revision:

Operation: Outsource

Change No: CHG006

Mfg Date: 01/10/18

Job No: 168758-B

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	12/13/17		0.00	0.00	Start Up Stores/Pkg-1		DPZ
110	Packaging	1 pcs	12/13/17		0.00	0.00	Packaging1		GP
120	CNC Bend Crosstubes	1 pcs	12/13/17		3.11	2.22	CNC Bend Crosstube		GP
130	QC	1 pcs	12/13/17		0.00	0.00	QC15		AS 17-12-20
140	Crosstubes	1 pcs	12/13/17		0.00	0.67	Crosstube		DPZ
150	HandFXtube	1 pcs	12/13/17		0.00	0.98	HandFinish5		DPZ
160	QC	1 pcs	12/13/17		0.00	0.00	QC7		38 DAS
165	QC	1 pcs	12/13/17		0.00	0.00	QC5		9-89 38
170	Outsource	1 pcs	12/13/17				SKY002-VC		5018-01-290
180	Packaging	1 pcs	12/13/17		0.00	0.00	Packaging2		5018-01-10
190	QC	1 pcs	12/13/17		0.00	0.00	QC5		PO 10 JAN 1
200	SprayPaint	1 pcs	12/13/17		0.00	0.25	Spray Paint		DT 18-01-22 JAN 2 3 2018
210	QC	1 pcs	12/13/17		0.00	0.00	QC14		AS JAN 2 3 2018
220	Crosstubes	1 pcs	12/14/17		0.00	1.69	Crosstube		✓ AS 38 JAN 2 3 2018
230	QC	1 pcs	12/14/17		0.00	0.00	QC5		38
240	Packaging	1 pcs	12/14/17		0.00	0.00	Packaging1		9-89
250	QC	1 pcs	12/14/17		0.00	0.00	QC4		SmB
255	DC	1 pcs	12/14/17		0.00	0.00	DC		
260	Packaging	1 pcs	12/14/17		0.00	0.00	Packaging3		SmB
270	QC21-FG	1 Ea	12/14/17		0.00	0.00	QC21		JAN 2 9 2018

Part Op 120 - Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101

Descriptions: 140 - "1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10 2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141 4-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141"

150 - ***IMMEDIATELY AFTER GRINDING***

170 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order PO 038748 JAN 10 2017

180 - Ensure copy of NDT results attached to work order.

190 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D212-664-141

200 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** 1-Prime inside & outside crosstube as per QSI 005 4.2 BATCH: 2- After painting remove masking and apply matte clear coat per QSI005 4.2 3- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING 4 -Paint Outside of Tube as per Dart QSI 005 4.2 Primer 138646 Clear P.O. 38689 Paint white: 138669

210 - Then, Wrap in plastic bag to protect from scratches

220 - *****LAY DOWN CROSSTUBE ON TABLE AND PUT DT10302 PINS IN SADDLE HOLE FACING UP, USE HOLE IN TAPE MESURE TO PUT IN PINS FOR LOCATING CENTER OF CROSSTUBE. ***** 1- Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg 2- Install supports with Proseal 890 per D212-664-141 and QSI 015 A/R Proseal 890 Batch: 138708 EXP: 5/18

PROSEAL CURE TIME 72 HOURS: Start: 18-1-23 Finish: 18-1-26 3- Install clamps with rubber cushion (ENSURE CLAMPS ARE INSTALL ON TOP SIDE OF CROSSTUBE) using DT9565 as per Dwg D212-664-141. ***Torque all clamps to 80-100 IN-LBS.***

230 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***

250 - ***VERIFY BY BATCH # TO MATCH W/O

255 - Photocopy bluefile and create labels as per PPP D212-664-101 CHG006

260 - Identify and pack for shipping as per PPP D212-664-101 Location : FG094

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D212-664-101TRN	1	1	0	0
240-Packaging	AN6-35A	4	45	0	0
	AN6-36A	4	37	0	0
	D3428-1	1	19	0	0
	MS21042L6	6	172	0	0
	NAS1149D0663J	18	615	0	0

D2893-1 5032424 (3)

D3595-063450 5033985 (2)

MS21920-25 M138741-167 (4)

11/22/2017

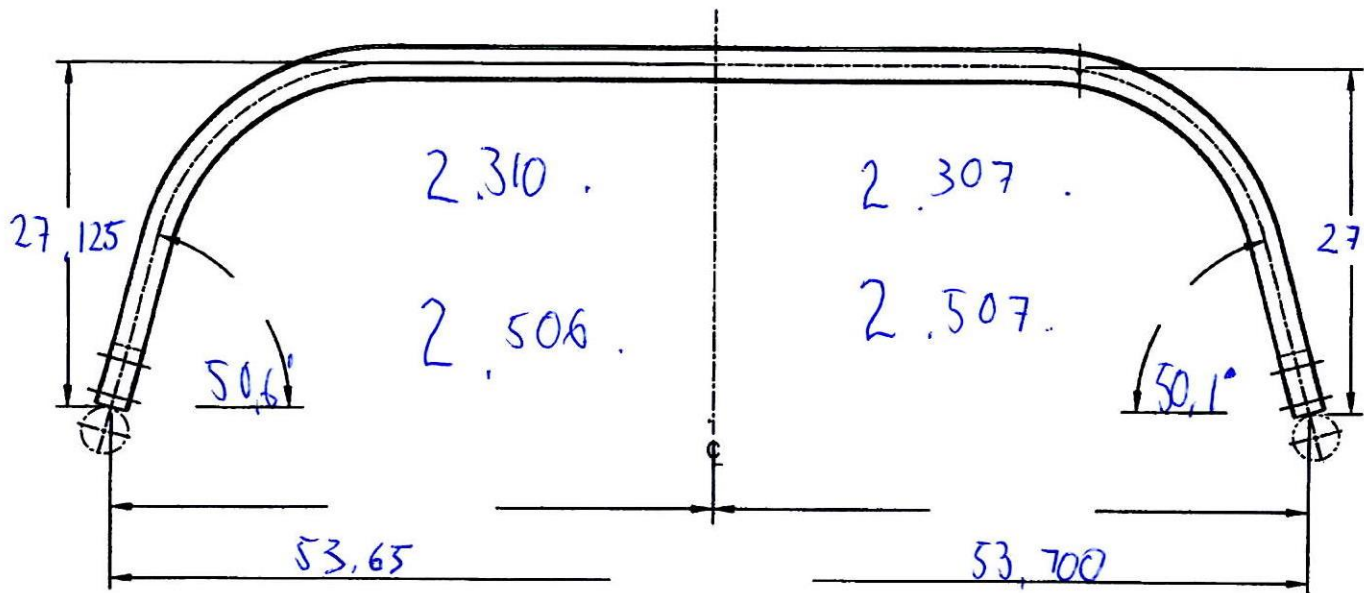
[Dart Hawkesbury] Job Sheet - Lacelle, Linda

Part Specifications
Specifications could not be found.

Plex 11/22/17 1:10 PM dart.lacelle.linda

DART AEROSPACE LTD		Work Order: 168758-6
Description: Crosstube High Fwd (205/212/412)		Part Number: D212-664-101
Inspection Dwg: D212-664-141 Rev: E		Page 1 of 1

Required Dimension	Min	Max
Height	26.67	27.17
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7
Bending Passes	3	--
Crushing	--	7.2%



	Side A	Side B
Bending Passes	4	4
Crushing	4.1%	4.1%
Comments		

QC15 Inspection	PD
Date	17-12-20

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	
E	14.07.28	Revised max crushing %	KJ	
F	16.01.15	Revised Height min/max dimensions	KJ	

Item	Qty -141	Qty -141B	Qty -141F	Part Number	Description
1	X			D212-864-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X		D212-864-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3			X	D212-864-141F	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD) (ANODIZED)
4	1	1	1	D6005-128	CROSSTUBE
5	2		2	D2893-1	SUPPORT
6	4	4	4	D3595-063-450	RUBBER CUSHION
7		2		D5017-1	SUPPORT
8	4	4	4	MS21920-25	CLAMP (OR MS21920-26)
9	A/R	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 128.514±0.020
- FINISH -141 & -141B: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)
d) PAINT OUTSIDE PER DART QSI 005 4.2
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
FINISH -141F: a) ANODIZE PER MIL-A-8625, TYPE II, CLASS 1.
b) ALODINE (DO NOT ETCH) PER QSI 005 4.1.2
c) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
d) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)
e) PAINT OUTSIDE PER DART QSI 005 4.2
f) REMOVE MASKING AND APPLY MATTE CLEAR COAT
- *NOTE: BETWEEN FINISHING OPERATIONS EXTREME CARE MUST BE TAKEN NOT TO CONTAMINATE OR DAMAGE FINISHED SURFACES.
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER 'D212-864-XXX' AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
- WEIGHT: D212-864-141/-141B/-141F = 33.6 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 8% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

ASSEMBLY

- TO INSTALL D2893-1 / D5017-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

E	ADD -141F, D5017-1 WAS D2893-1 (-141B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-3), INCORP. DEC D-1/2-3	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-048 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 8398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D212-864-141	REV. E SHEET 1 OF 5
TITLE XTUBE ASSY (205/212/412 HI FWD)	SCALE NTS
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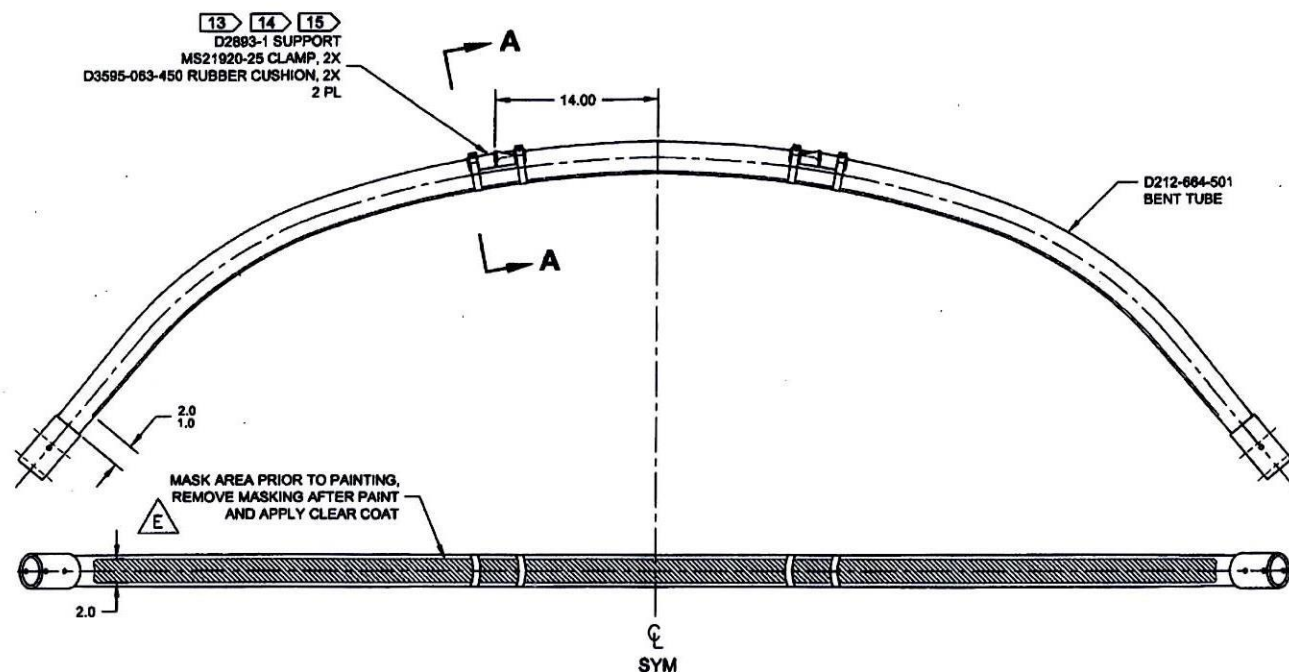
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2014-05-26
WD

168758-B

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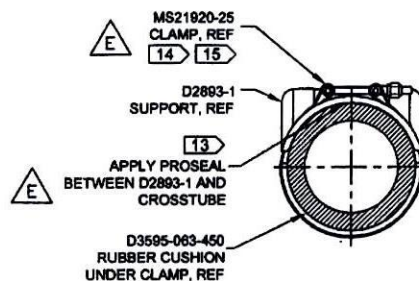
D
C
B
A

D
C
B
A



**D212-664-141/-141F
ASSEMBLY DETAIL**

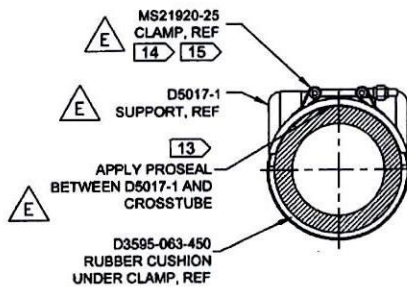
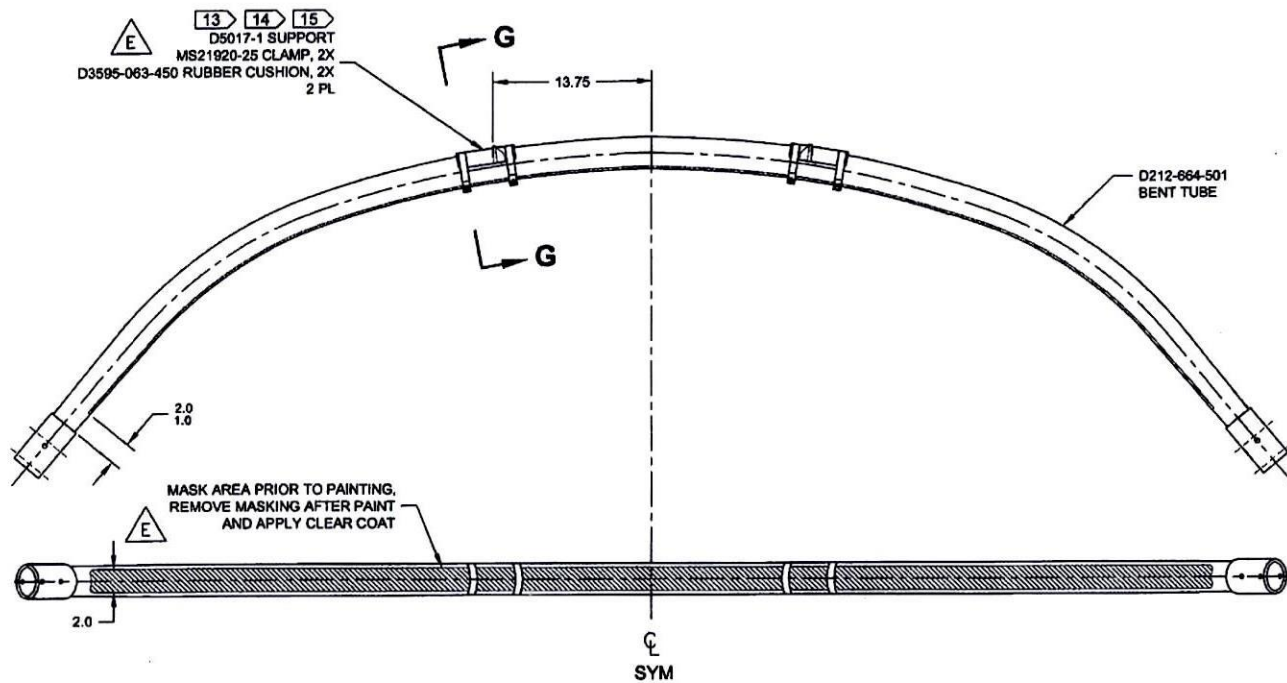
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2014-05-26
MD



**SECTION A-A
SCALE 4X**

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-141	SHEET 2 OF 5
APPROVED		TITLE	SCALE
DE APPR.		XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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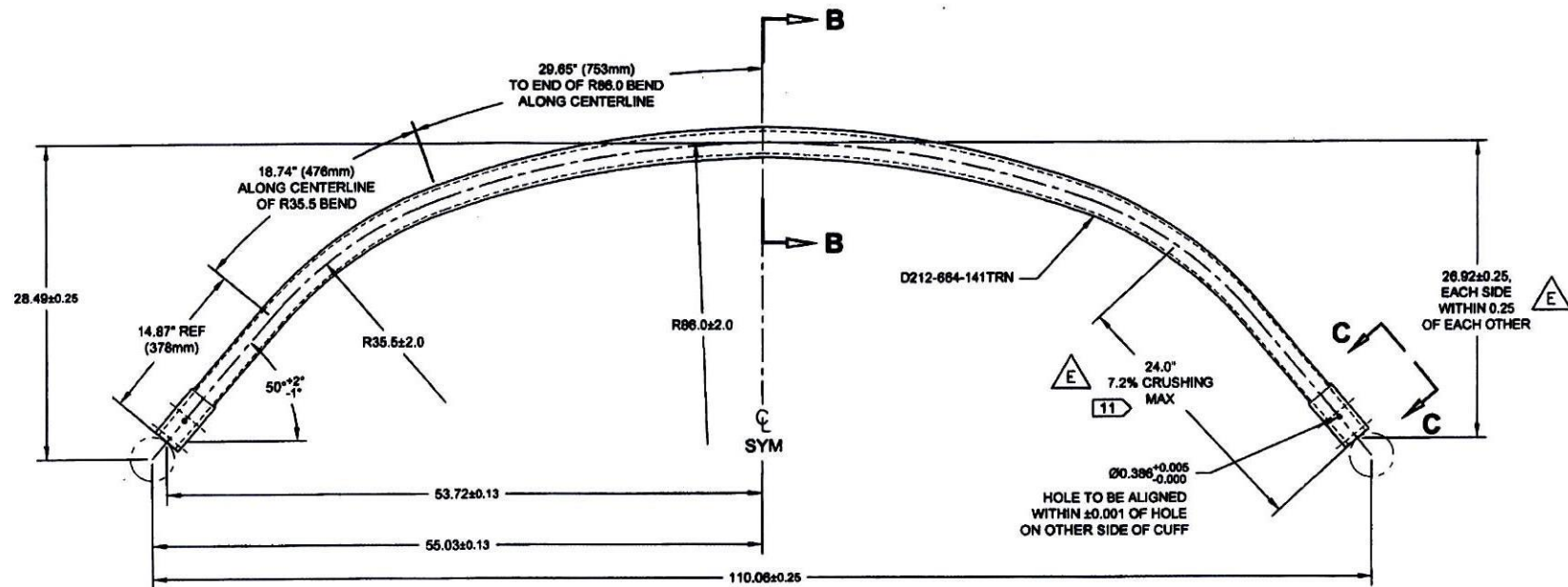


SECTION G-G
SCALE 4X

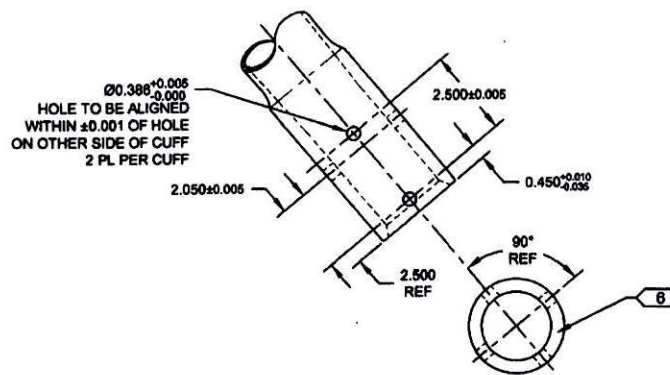
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ASSEMBLY DETAIL

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2014-05-26

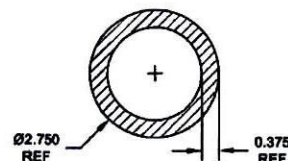
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-141	SHEET 3 OF 5
APPROVED		TITLE	SCALE
DE APPR.		XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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D212-664-501
BENDING AND DRILLING DETAIL 11



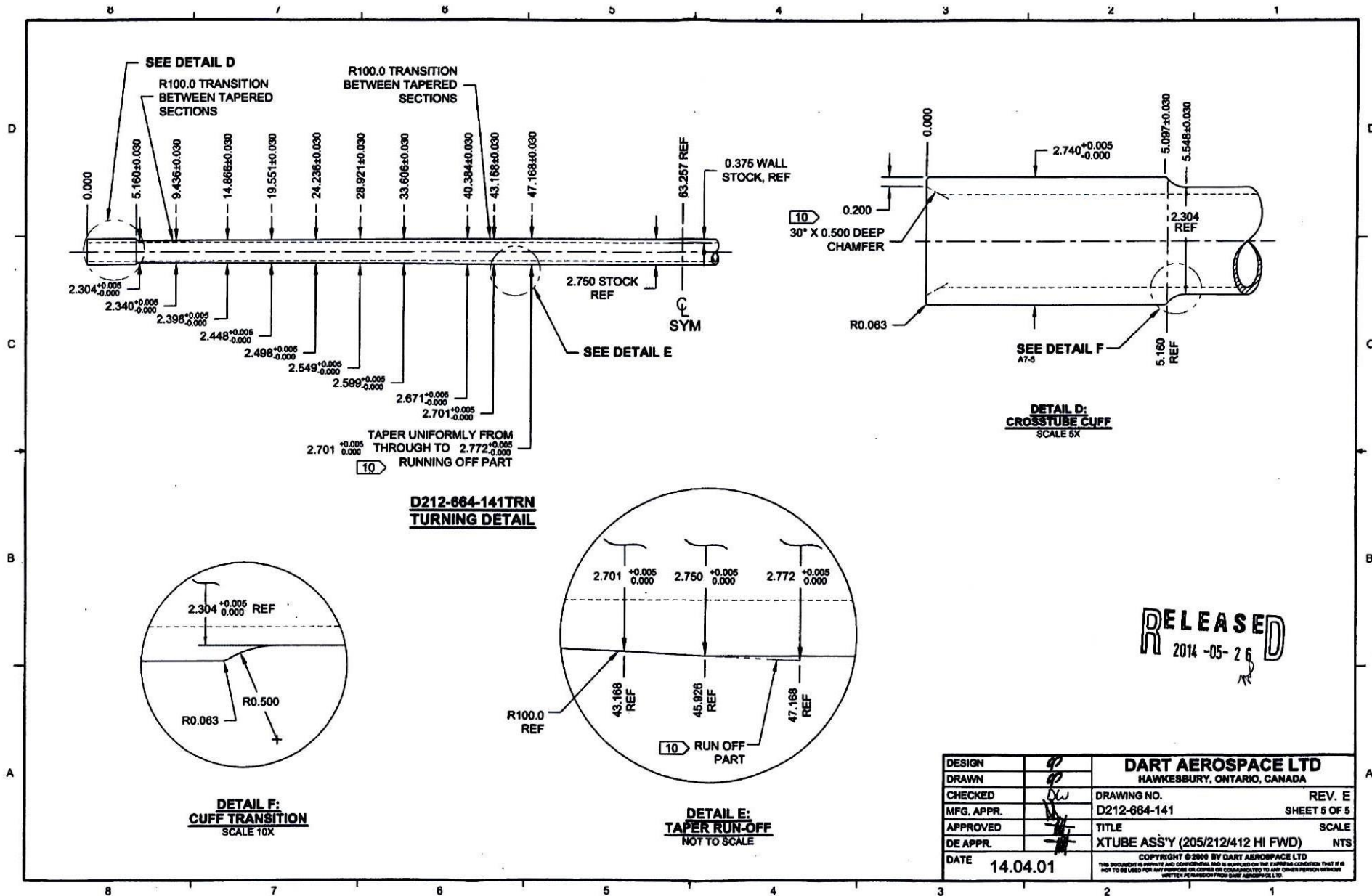
VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

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2014-05-26

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-141	SHEET 4 OF 5
APPROVED		TITLE	SCALE
DE APPR.		XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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PURCHASE ORDER **PO038748**

Tel (613) 632-5200

Dart Aerospace Ltd.
 1270 Aberdeen St
 Hawkesbury, ON
 K6A 1K7
 Canada



Supplier:

SKY002-VC
 SkyService
 6120 Midfield Road
 Mississauga
 ON
 L5P 1B1 Canada
 Phone: 905-678-5636
 Fax: 905-678-5841

Ship To:

1270 Aberdeen Street
 Hawkesbury
 ON
 K6A 1K7 Canada
 Phone: 613-632-5200

PO No:

PO038748

PO Date:

1/9/18

Due Date:

1/9/18

Purchase Order

Revision:

Revision Date:

Phone:

Ship-To Contact:

Ground

Via:

Net 30

Pymt Terms:

Freight Terms:

Special Comments:



Line	Item	Job	Part	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	168062	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13
2	168758-B	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13
3	168758	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13
4	168758-A	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13
5	169743	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13
6	169740	D212-664-101	Fwd Crosstube - High	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	1/9/18	1 pcs	0 pcs	1 pcs	\$133.125/pcs	\$133.13

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO34561	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO38748
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 8 CROSSTUBES

ITEM ID: D212-664-101 FWD CROSSTUBE HIGH

1 - WORK ORDER ID#: 169744

2 - WORK ORDER ID#: 169742

3 - WORK ORDER ID#: 169740

4 - WORK ORDER ID#: 169743

5 - WORK ORDER ID#: 168758-A

6 - WORK ORDER ID#: 168758

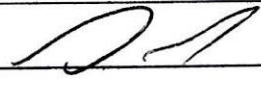
7 - WORK ORDER ID#: 168758-B

8 - WORK ORDER ID#: 168062

8818-01-10

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-8) AS PER ASTM1417M-13						9 JAN 2018	 f
NO CRACK FOUND							
Pen: ZL-27A MWO5678 DEV: SKD-S2 MPO11715 CLEANER: SKC-S MPO13923							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:		ACA/SCA Stamp DOT-APP 61 53-89	Date: 9 JAN 2018
Name:	ANTONINO Marchetti		



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Master Unit 000150

Tel (613) 632-5200

Containers on Master Unit 000150				
Serial No	Part No	Customer Part No	Status	Quantity
S036105	AN6-35A		Allocated	3
S036106	AN6-35A		Allocated	1
S036104	AN6-36A		Allocated	4
F159495	D3428-1		Allocated	1
S036103	MS21042L6		Allocated	6
S036102	NAS1149D0663J		Allocated	18